Physiotherapy Management of “Long COVID”

Mark Hall, PT PhD
Jessica DeMars PT BScPT
COVID 19

• Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a highly contagious coronavirus that causes Coronavirus Disease 2019 (COVID-19).¹, ²

• Most common symptoms are fever, (89%) cough (50-80%), fatigue (70%), dyspnoea (20-40%), upper resp illness (15%) GI Symptoms (10%) ¹, ²

• Loss of taste or smell, stroke, myalgias, headache, skin rash present to varying degrees
Global Situation

- **109,217,366** confirmed cases
- **2,413,912** deaths

Canada

- **826,924** confirmed cases
- **21,311** deaths

Feb 17, 2021 - WHO https://covid19.who.int/region/amro/country/ca
Current reports estimate that 80% of cases are asymptomatic or mild; 15% of cases are severe (requiring oxygen); and 5% are critical requiring mechanical ventilation and life support.

Patients requiring critical care tend to be older (median age ≈60 years), and 40% have comorbid conditions, commonly diabetes and cardiac disease.

Principle feature of severe disease is the development of ARDS
Persistent Symptoms?

- Mid 2020, reports of persistent symptoms
- “Long COVID” Post-COVID-19 syndrome:
  - cluster of signs and symptoms that develop during or after an infection consistent with COVID-19, continue for more than 12 weeks and are not explained by an alternative diagnosis

NICE guideline [NG188] December 2020
• Little empirical research on “long COVID”
• Anecdotes of experiences from healthcare workers and patients shared across social media platforms
• A small number of studies are emerging
Patient Led Research

The Body Politic COVID-19 support group set up and published an influential patient led symptom study. Most in the study had been ill for 6 weeks.

https://mecfsresearchreview.me/2020/09/17/understanding-long-covid-a-shortcut-to-solving-me-cfs/#symptoms
One in five people who test positive for Covid-19 have symptoms for five weeks or longer.\(^6\)

For around one in 10 people, they last 12 weeks or longer.

- Fatigue - most commonly reported symptom
- Post-exertion malaise
- Breathlessness
- Anxiety and depression
- Heart palpitations
- Chest pains
- Joint or muscle pain
- Not being able to think straight or focus (‘brain fog’)
A study from Italy reported that roughly 87% patients discharged from a Rome hospital after recovering from Covid-19 were still experiencing at least one symptom 60 days after illness. 6

- Only 13% of the 143 people were completely free of any symptoms
- 32% had one or two symptoms, and 55% had three or more.
- Many reported fatigue (53%), dyspnoea (43%), joint pain (27%), and chest pain (22%).
- 40% reported a worsened quality of life.

Ongoing health problems include: breathing difficulties, enduring tiredness, reduced muscle function, impaired ability to perform vital everyday tasks, and mental health problems such as post-traumatic stress disorder, anxiety, and depression”
Characterizing Long COVID in an International Cohort: 7 Months of Symptoms and Their Impact

Hannah E. Davis¹*, Gina S. Assaf¹*, Lisa McCorkell¹*, Hannah Wei¹*, Ryan J. Low¹,²*, Yochai Re’em¹,³*, Signe Redfield¹, Jared P. Austin⁴, Athena Akrami¹,²*+

- International online study - 3762 respondents from 56 countries with symptoms lasting >28 days (Symptoms consistent with COVID with (27%) and without positive test)
- 257 question survey - 205 symptoms identified
- 96% reported symptoms >90 days
- Most frequent symptoms after 6 months - fatigue (78%) post-exertional malaise (72%) and cognitive dysfunction (55%)
Relapsing and Remitting

- A key feature of the condition is that symptoms can suddenly worsen following only minimal physical or mental activity.
- Roughly 85% report relapses after 7 months, with physical activity, stress, exercise and mental activity being the most common triggers of relapse.\(^{12}\)
- Trajectory is not standard - some stable others have fluctuating symptoms over a 6 month or longer period.
Organ Damage

COVID-19 primarily affects the lungs, but can damage many other organs as well. Organs that may be affected by COVID-19 include:

- Heart - Imaging taken months after recovery show lasting damage to the heart muscle, even in those with mild COVID-19 symptoms. This may increase the risk of heart failure or other heart complications in the future.
- Lungs - Pneumonia often associated with COVID-19 can cause long-standing damage to alveoli leading to long term breathing issues.
- Brain - Even in young people, COVID-19 can cause strokes, seizures and Guillain-Barre syndrome.
Cardiac Involvement

- Up to 20%–30% of patients hospitalized with COVID-19 have evidence of myocardial involvement manifested by elevated troponin levels and cardiac arrhythmia.\(^8,9\)
- Myocarditis is an inflammatory disease of the heart characterized by inflammatory infiltrates and myocardial injury without an ischemic cause - most commonly viral.
  - Higher risk of in-hospital mortality and higher risk of cardiac arrhythmias.
- While COVID-19 myocardial injury has been described in the sickest of patients, prevalence of roughly 30% among the young and in low risk populations
Evidence from SARS

• Survivors of other viral outbreaks report similar symptoms
• A syndrome of chronic fatigue, pain, weakness, depression and sleep disturbance with healthcare workers unable to return to work for up to 3 years\textsuperscript{10}
• Impaired lung function, reduced exercise capacity, and health status reported 2 years after infection, more pronounced in healthcare workers\textsuperscript{11}


4. COVID-19 rapid guideline: managing the long-term effects of COVID-19, NICE guideline [NG188] Published date: 18 December 2020


Clinical Experience
Treating Long Covid

Jessica DeMars, PT
4 Phenotypes

- Post ICU
- Post-Viral Fatigue
- Permanent Organ Damage
- Long Covid

-National Institute for Health Research
“The symptoms cause anxiety not vice versa.” Jo

Definitely there was so much changing over time, it’s what makes it so stressful, you’re going along and feeling that maybe some symptoms are behind you, but then you come up with some other completely different thing, I think if it were not so frightening it would be laughable. I first had symptoms on 5th March but it wasn’t until mid-May my heart symptoms came on and they were the most frightening of all.” Patricia

“It’s a roller coaster rather than an incline. I’m going up and down and up and down. If I do too much I feel worse, and if I don’t do enough I feel worse and so when I feel better I have to bank the energy.” Nigel
Long Covid Symptoms

Persistent symptoms 3 months after a SARS-CoV-2 infection: the post-COVID-19 syndrome?

Goertz et al
ERJ Open Research Oct 2020, 6 (4) 00542-2020;
DOI: 10.1183/23120541.00542-2020
Assessment

- Patient Reported Outcome Measures
  - Self Evaluation of Breathing Questionnaire
  - Multi-Dimensional Fatigue Index
  - DePaul Symptom Questionnaire
  - Post Covid Functional Status
### The Self Evaluation of Breathing Questionnaire

Scoring: (0) never true at all; (1) occasionally/a bit true; (2) frequently–mostly true; and, (3) very frequently/very true

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<td>1. I get easily breathless out of proportion to my fitness</td>
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<td>2. I notice myself breathing shallowly</td>
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<td>3. I get short of breath reading and talking</td>
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<td>4. I notice myself sighing</td>
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<td>5. I noticing myself yawning</td>
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<td>6. I feel I cannot get a deep or satisfying breath</td>
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<td>7. I notice that I am breathing irregularly</td>
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<td>8. My breathing feels stuck or restricted</td>
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<td>9. My ribcage feels tight and cannot expand</td>
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<td>10. I notice myself breathing quickly</td>
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<td>11. I get breathless when I am anxious</td>
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<td>12. I find myself holding my breath</td>
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<td>13. I feel breathless in association with other physical symptoms</td>
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<td>14. I have trouble coordinating my breathing when I am speaking</td>
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<td>15. I can’t catch my breath</td>
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<td>16. I feel that the air is stuffy, as if not enough air in the room</td>
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<td>17. I get breathless even when I am resting</td>
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<td>18. My breath feels like it does not go in all the way</td>
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<tr>
<td>19. My breath feels like it does not go out all the way</td>
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<td>20. My breathing is heavy</td>
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<td>21. I feel that I am breathing more</td>
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<td>22. My breathing requires work</td>
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<td>23. My breathing requires effort</td>
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<td>24. I find myself breathing through my mouth during the day</td>
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<td>25. I breathe through my mouth at night while I sleep</td>
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<td><strong>Total</strong></td>
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A score greater than 11 may indicate problems with your breathing.

### MFI® MULTIDIMENSIONAL FATIGUE INVENTORY

**Instructions:**

By means of the following statements we would like to get an idea of how you have been feeling lately. There is, for example, the statement: "I FEEL RELAXED"

If you think that this is entirely true, that indeed you have been feeling relaxed lately, please place an X in the extreme left box like this:

- yes, that is true: [X] [X] [X] [X] [X] no, that is not true

The more you disagree with the statement, the more you can place an X in the direction of "no, that is not true". Please do not miss out a statement and place only one X in a box for each statement.

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<td>1. I feel fit.</td>
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<td>2. Physically, I feel only able to do a little.</td>
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<td>3. I feel very active.</td>
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<td>4. I feel like doing all sorts of nice things.</td>
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<td>5. I feel tired.</td>
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<td>6. I think I do a lot in a day.</td>
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<td>7. When I am doing something, I can keep my thoughts on it.</td>
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<td>8. Physically I can take on a lot.</td>
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<td>9. I dread having to do things.</td>
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<td>10. I think I do very little in a day.</td>
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<td>11. I can concentrate well.</td>
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<td>12. I am rested.</td>
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<td>13. It takes a lot of effort to concentrate on things.</td>
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<td>14. Physically I feel I am in a bad condition.</td>
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<td>15. I have a lot of plans.</td>
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<td>16. I tire easily.</td>
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<td>17. I get little done.</td>
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<td>18. I don’t feel like doing anything.</td>
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<td>19. My thoughts easily wander.</td>
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<td>20. Physically I feel I am in an excellent condition.</td>
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Does your post-Covid-19 patient have symptoms of Post Viral Fatigue Syndrome?

- Activity induced fatigue (physical and mental)
- Intermittent and recurring flare of viral symptoms
- Unable to maintain previous levels of activity
- Unrefreshing sleep
- Cognitive problems
- Orthostatic intolerances

! Consider Post Viral Fatigue Syndrome (PVFS)

▲ Standard rehabilitation may be detrimental

Visit www.physiosforme.com for more info
What is Post-exertional Malaise Following Physical Activity?

Post-exertional malaise (PEM) is considered the hallmark clinical feature of myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS). PEM is the worsening of symptoms and decreased function following physical, cognitive, or emotional effort. The onset may occur immediately after activity or be delayed. Immediate, short-term and long-term PEM symptoms following physical activity can be explained in terms of the damaged energy systems found in ME/CFS. Overload in other areas (cognitive, emotional, sensory, upright posture, etc.) can also cause immediate and longer-term symptoms, but responses to these stressors are less well documented in the literature.

PEM Timecourse

Immediate

Symptoms after physical activity are the direct result of exceeding the anaerobic threshold. Examples include fatigue, out of breath, dizziness and nausea. For healthy individuals, immediate symptoms from exercise stress resolve quickly but for people with ME/CFS they begin to worsen.

Short-term

Lasts 2-4 days and reflects “overdoing activities” that exceed the anaerobic threshold for an extended period or multiple times per day exhausting the ability of the body to supply daily energy needs. Symptoms of short-term PEM include muscle/joint pain, brain fog, headache and sleep disturbance. These symptoms reflect dysfunctional neurological and cardiopulmonary responses.

Long-term

Lasts 7 days or more and reflects a sustained immune response consistent with a damaged aerobic energy system. Signs may include weakness, a decrease in function, flu-like and cardiopulmonary symptoms.
Respiratory Assessment

- Pulse Oximetry
- Respiratory Rate
- Breathing Pattern
- Maximum Inspiratory Pressure
- End Tidal CO₂
Cardiac Assessment

- Blood Pressure
- Heart Rate
- Heart Rate Variability
Functional Status

- 6-minute walk test
- 1 minute STS, 30 sec STS
- TUG, Single Leg Balance
- Grip Strength
20 patients; 1 hospitalized, 1 ICU
1 aged 19-29
6 aged 30-39
10 aged 40-49
1 aged 50-59
1 60-69
1 aged 70+
15 females, 5 males

7 did not receive a positive test
Clinical Findings:
Reduced Maximum Inspiratory Pressure
Clinical Findings:
Reduced respiratory Muscle Endurance
Clinical Findings:

Respiratory rate/pattern/HRV
• Increased rate
• Reduced exhale phase
• Reduced HRV
Treatment Strategies

- Fatigue management – STOP, REST, PACE
- Respiratory – breathing regulation, cough management
- Autonomic Response monitoring – watch for POTS-like symptoms
- Exercise Prescription – when appropriate
- Support / Advocate – red flags
Key things you need to know

Check Vitals
- RR, HR, BP, SpO2

Exercise is medicine – except when it’s not
- Recognizing PEM and how to manage with pacing

Physio role
- Address respiratory concerns – breathing, coughing
- Health coaching – fatigue management, pacing, support
- Monitoring tolerance to activities and progressing as/if indicated
GET INFORMED!
- New disease
- Variable symptoms and multi-system involvement
- Lots of information coming in all the time
- Need for patient-centered/patient-led care
Resources

• https://longcovid.physio/longcovid

• https://physio-pedia.com/Long_COVID


• www.physiosforme.com

• www.bradcliff.com